

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of :
STEBBINGS et al. :
Serial No. : Group Art Unit:
Filed: : Examiner:

For: SECURITY MARKING SYSTEM AND METHOD FOR MINIMIZING PIRATING OF DATA ON
DATA MEDIA INCLUDING COMPACT DISCS AND DIGITAL VERSATILE DISCS

PRELIMINARY AMENDMENT

Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

Sir:

Preliminary to examination of the above-referenced application, please amend the application as follows:

IN THE SPECIFICATION:

Please amend the specification as follows:

Page 1, after RELATED APPLICATION please delete:

"This application claims priority from U. S. provisional Application No. 60/091,036, filed June 29, 1998, which is incorporated herein by reference." and insert in its place:

--This application is a divisional application of U.S. Application No. 09/448,409 filed November 23, 1999 which is a continuation of International Application No. PCT/US99/14621, filed June 29, 1999, which in turn claims priority from U.S. Provisional Application No. 60/091,036, filed June 29, 1998, each of which is incorporated herein by reference.--

Page 1, line 13, change "09/-----" to --09/315,104--;

Page 1, line 19, change "09/-----" to --09/315,012--;

Page 2, line 3, change "09/-----" to --09/315,102--;

Page 6, line 4, change "Figure 2" to --Figures 2A and 2B--;

Page 7, line 3, change "Figure 2" to --Figures 2A and 2B--;

Page 36, line 13, change "Figure 2 shows" to --Figures 2A and 2B show--.

Page 36, line 13, change "Figure 2 shows" to --Figures 2A and 2B show--.

Please find attached a marked up version of the above referenced specification pages as Appendix A.

Also attached please find replacement pages 1, 2, 6, 7 and 36 as Appendix B.

IN THE CLAIMS

Please amend the claims as follows:

Please cancel claims 1 through 14, 16, and 19 through 23 without prejudice or disclaimer.

A clean copy of the claims is attached herewith as Appendix C.

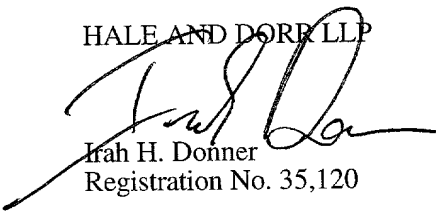
AUTHORIZATION

The Commissioner is hereby authorized to charge any additional fees which may be required for this Amendment, or credit any overpayment to deposit account no. 50-0436.

In the event that an extension of time is required, or which may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to deposit account no. 50-0436.

Respectfully Submitted,

HALE AND DORR LLP


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**SECURITY MARKING SYSTEM AND METHOD FOR
MINIMIZING PIRATING OF DATA ON DATA MEDIA
INCLUDING COMPACT DISCS AND DIGITAL VERSATILE DISCS**

RELATED APPLICATION

~~This application claims priority from U. S. provisional Application No. 60/091,036, filed June 29, 1998, which is incorporated herein by reference. This application is a divisional application of U.S. Application No. 09/448,409 filed November 23, 1999 which is a continuation of International Application No. PCT/US99/14621, filed June 29, 1999, which in turn claims priority from U.S. Provisional Application No. 60/091,036, filed June 29, 1998, each of which is incorporated herein by reference.~~

This application is also related to: U.S. Non-provisional Application entitled, "Data Disc Modulation for Minimizing Pirating and/or Unauthorized Copying and/or Unauthorized Access of/to Data on/from Data Media including Compact Discs and Digital Versatile Discs", filed May 20, 1999, Application No. 09/315,104—; U. S. Nonprovisional Application entitled, "Method for Minimizing Pirating and/or Unauthorized

Copying and/or Unauthorized Access of/to Data on/from Data Media including Compact Discs and Digital Versatile Discs, and System and Data Media for Same", filed May 20, 1999, Application No. 09/315,012———; and U. S. Nonprovisional Application entitled, "Method for Minimizing Pirating and/or Unauthorized Copying and/or Unauthorized Access of/to Data on/from Data Media including Compact Discs and Digital Versatile Discs, and System and Data Media for Same", filed May 20, 1999, Application No. 09/315,102———, all three of which are incorporated herein by reference.

FIELD OF INVENTION

This invention relates generally to anti-data pirating technology. More specifically, the invention relates to a method and system of marking data discs by introducing, into the polycarbonate material, a predetermined tracing substance known as a security marking during the manufacturing stage of the polycarbonate material. This marking technique is useful in tracking pirated data and/or sources, such as

All disc dimensions, including those pertaining to pit and physical formations, which encode data, are defined in the CD standard. For example, specifications information on sampling frequency, quantization word length, data rate, error correction code, and modulation scheme are all defined in the standard. Properties of the optical system that reads data from the disc using a leaser beam are also defined in the standard. Moreover, basis specifications relevant to CD player design is located in the signal format specifications.

Referring to Prior Art Figure 2A and 2B, the physical characteristics of the compact disc surface structure are described. Each CD is less than 5 inches in diameter whose track thickness is essentially thinner than a hair and whose track length averages approximately 3 and a half miles. The innermost portion of the disc is a hole, with a diameter of 15 mm, that does not hold data. The hole provides a clamping area for the CD player to hold the CD firmly to the spindle motor shaft.

Data is recorded on a surface area of the disc that is 35.5 mm wide. A lead-in area rings the innermost data area, and a lead-out area rings the outermost area. Both lead-in and lead-out areas contain non-audio data used to control the CD player. Generally, a change in appearance in the reflective data surface of a disc marks the end of musical information.

A transparent plastic substrate comprises most of the CD's 1.2 mm thickness. Viewing a magnified portion of the CD surface, as shown in Prior Art Figure 2A and 2B, the top surface of the CD is covered with a very thin metal layer of generally aluminum, silver or gold.

Data is physically contained in pits impressed along the CD's top surface. Above this metalized pit surface and disc substrate lies another thin protective lacquer coating (10 to 30 micrometers). An identifying label (5 micrometers) is printed on top of the lacquer coating.

A system of mirrors and lenses sends a beam of laser light to read the data. A laser beam is applied to the underside of a CD and passes through the

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a conventional specification table for a conventional compact disc system.

Figures 2A and 2B shows a scale drawing of a conventional CD data surface.

Figure 3 shows a typical compact disc pit surface.

Figure 4 shows a diagram of a conventional pit track.

Figure 5 shows a conventional bump height on a CD surface.

Figure 6 illustrates three graphic presentations of a mass spectrum traced by a five-element galvanometer.

Figure 7 illustrates a block diagram of the overall distribution path of a polycarbonate product, such as a CD or DVD, from manufacture to distribution to a customer.

Figure 8 illustrates the hierarchical relationship and the number of entities involved in the overall distribution of a polycarbonate product from manufacture to distribution to a customer.

**SECURITY MARKING SYSTEM AND METHOD FOR
MINIMIZING PIRATING OF DATA ON DATA MEDIA
INCLUDING COMPACT DISCS AND DIGITAL VERSATILE DISCS**

RELATED APPLICATION

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including Compact Discs and Digital Versatile Discs, and System and Data Media for Same", filed May 20, 1999, Application No. 09/315,102, all three of which are incorporated herein by reference.

FIELD OF INVENTION

This invention relates generally to anti-data pirating technology. More specifically, the invention relates to a method and system of marking data discs by introducing, into the polycarbonate material, a predetermined tracing substance known as a security marking during the manufacturing stage of the polycarbonate material. This marking technique is useful in tracking pirated data and/or sources, such as compact discs (CDs) or digital versatile discs (DVDs), to thereby prevent future pirating of data.

BACKGROUND OF THE INVENTION

There are two basic methods for recording sound and music - analog and digital. See e.g. Ken C. Pohlmann, AThe Compact Disc@, THE COMPUTER MUSIC & DIGITAL AUDIO SERIES, Volume 5. The above-mentioned

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standard. Moreover, basis specifications relevant to CD player design is located in the signal format specifications.

Referring to Prior Art Figure 2A and 2B, the physical characteristics of the compact disc surface structure are described. Each CD is less than 5 inches in diameter whose track thickness is essentially thinner than a hair and whose track length averages approximately 3 and a half miles. The innermost portion of the disc is a hole, with a diameter of 15 mm, that does not hold data. The hole provides a clamping area for the CD player to hold the CD firmly to the spindle motor shaft.

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A transparent plastic substrate comprises most of the CD's 1.2 mm thickness. Viewing a magnified portion of the CD surface, as shown in Prior Art Figure 2A and 2B, the top surface of the CD is covered with a very thin metal layer of generally aluminum, silver or gold. Data is physically contained in pits impressed along the CD's top surface. Above this metalized pit surface and disc substrate lies another thin protective lacquer coating (10 to 30 micrometers). An identifying label (5 micrometers) is printed on top of the lacquer coating.

A system of mirrors and lenses sends a beam of laser light to read the data. A laser beam is applied to the underside of a CD and passes through the transparent substrate and back again. The beam is focused on the metalized data surface that is sandwiched or embedded inside the disc. As the disc rotates, the laser beam moves across the disc from the center to the edge. This beam produces on-off code signals that are converted into, for example, a stereo electric signal.

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various features of novelty that characterize the invention, are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and the specific objects attained by its uses, reference should be had to the accompanying drawings and descriptive matter, which illustrate preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

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15. A method of marking a protective layer of a product at least one of comprised of and including a portion of polymer, said method used to track said product and inhibit at least one of piracy, unauthorized access and unauthorized copying of said product, said method comprising the steps of:

(a) introducing at least one predetermined tracing substance as a predetermined marking in the polycarbonate material of the protective layer of the product in quantities that will not adversely effect at least one of performance, structure of, and the data stored on, the product; and

(b) manufacturing the product with the at least one predetermined tracing substance introduced therein in said introducing step (a).

17. A system of marking a protective layer of a product at least one of comprised of and including a portion of polymer, said system used to track said product and inhibit at least one of piracy, unauthorized access and unauthorized copying of said product, comprising:

means for introducing at least one predetermined tracing substance as a predetermined marking in the polycarbonate material of the protective layer of the product in quantities that will not adversely effect at least one of performance, structure of, and the data stored on, the product; and

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means for manufacturing the product with the at least one predetermined tracing substance introduced therein by said means for introducing.

18. A system of marking a product at least one of comprised of and including a portion of polymer, said system used to track said product and inhibit at least one of piracy, unauthorized access and unauthorized copying of said product, comprising:

a substance introduction system introducing at least one predetermined tracing substance as a predetermined marking in the polycarbonate material of the product in quantities that will not adversely effect at least one of performance, structure of, and the data stored on, the product; and

a product manufacturing system, operatively connected and structurally responsive to said substance introduction system, and manufacturing the product with the at least one predetermined tracing substance introduced therein by said substance introduction system.

24. In a security marking method for marking a polycarbonate-based product to inhibit at least one of piracy, unauthorized access and unauthorized copying of said product, a data message impregnated with at least one predetermined tracing substance providing the security marking used for at least one

of tracking and authenticating said data message, the at least one predetermined tracing substance including predetermined concentration amounts of at least an isotope, a plurality of isotopes and a plurality of stable isotopes, and the predetermined tracing substance indicative of product information including at least one of a lot number, batch number, shipper, recipient, shipping date, manufacturer identity, manufacturing date and designated product purpose.

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